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ABSTRACT

This study shows how performance measurement can be developed to take advantage of the most advanced computer software and hardware now available. The "Toolbox" study was commissioned by the European Commission (EC) and undertaken by De Montfort University in partnership with Essex County Libraries and the Library and Information Statistics Unit at Loughborough University (England). Performance measurement systems to benefit library management should include mechanisms for: monitoring performance, monitoring the results of innovation, identifying problems and opportunities, evaluating alternative options, and planning. In most advanced countries libraries have a fully computerized catalog, an integrated computer system, open access, and devolved budgets. Part 1 is an introduction. Part 2 considers shortcomings in current performance indicators and proposes a general strategy to make the best use of present computer power. Part 3 outlines proposals to initiate and improve particular performance measures. Performance measures are described for analysis of staff time, speed in acquiring items and satisfying requests, user analysis, numbers of active users, use of information or reference services, space provision, stock quality analyzed by age and title counts, interlibrary loans and acquisitions, and service points and opening hours. Part 4 considers the applicability of these techniques to libraries of different type and size, particularly academic and public libraries. Figures show cost benefit data, request statistics, and weighted average calculations for bookstock. (SWC)

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EC Toolbox Project: General Findings and Some Particular Proposals - The Next Generation of Performance Indicators

by John Sumsion

and

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EC Toolbox Project: General Findings and Some Particular Proposals - The Next Generation of Performance Indicators

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This paper derives from research commissioned by the European Commission and undertaken in 1994 by De Montfort University in partnership with Essex County Libraries and the Library & Information Statistics Unit at Loughborough University. Informally it was known as the Toolbox study. Publication of the full report of that work is expected in October 1995 as *Library performance indicators and management models*, Sumsion J. and Ward S., Libraries in the information society series, Office of the European Communities, ref. EUR 16448EN. The findings here are reproduced by agreement of the EC. The very substantial contributions of colleagues to the text of this paper is acknowledged.

This paper is in four parts. After the Introduction Part II considers shortcomings in current performance indicators - as revealed by the recent study - and proposes a general strategy to make best use of present computer power. Particular attention is drawn to the weak area of Cost:Output ratios. Part III outlines proposals to initiate and improve particular performance measures. Part IV considers briefly the applicability of these techniques to libraries of different type and size.

1. Introduction

Although many libraries in Europe and throughout the world still operate from closed access stocks, the more typical situation is one of open access for most materials and this is the situation addressed here. Performance indicators are considered in a broad context. There is not intended to be any particular distinction between them and the IT framework provided by Management Information Systems (MIS), Decision Support Systems (DSS) or later developments. Their purpose covers:

- monitoring performance
- monitoring the results of innovation
- identifying problems and opportunities
- evaluation of alternative options
- planning

One aim of this Toolbox study is to show how performance measurement can be developed to take advantage of the most advanced computer software and hardware now available for all but the smallest libraries. The project most definitely aimed to specify to systems suppliers what should be developed to benefit library management.

Having examined the extent of performance indicators in practice - and their shortcomings - the study then proceeded to put together a Toolbox of performance indicators and measures. This was designed both to be comprehensive and innovative. We aimed to include all the important indicators already developed, with appropriate references. Some new and extended indicators were added to meet shortcomings - and to employ latest computing facilities. (An example page to show the format is reproduced at the end of this paper.) This paper covers only some of the most significant indicators. The methodology, which worked well, was (1) literature search and study, (2) outline draft, (3) consultation on this draft with expert professionals in several countries, (4) modifications and conclusions.

It was known from the start that there would be follow-up projects, involving systems suppliers, to put into practice the general measures outlined. These are the EC projects now under way - DECIDE, DECIMAL, EQLIPSE and MINSTREL.

The place of performance indicators in the sequence of major development deserves mention. In the most advanced countries a fully computerised catalogue, an integrated computer system, open access and devolved budgets are now the rule. Elsewhere questions arise whether such developments have to happen sequentially or can be implemented together. The most important development stages are:

1. open access to stock
2. material on computerised catalogue
3. material on computerised circulation system
4. short loan textbook collection (academic only)
5. acquisitions computerised

6. other functions computerised

7. 'ideal' system with open systems and relational databases

It is arguable that all these steps should be complete (or at least the first six) before consideration is given to the type of toolbox described. While advanced systems have existed for over six years, there are still many places where obsolete software and hardware inhibit a modern approach.

II. Shortcomings of Traditional Performance Indicators

(a) THE CURRENT SITUATION IN EUROPE

While the impact of information technology in many libraries in Europe is still limited, the study revealed much notable work and experimentation in performance measurement and decision support techniques. Typically there are but a few 'pioneers' in each country and sector; library managers in general have been slow to adapt to management techniques and tools widely used in other professions. This is due inter alia to

- 'educational deficiencies' in that librarians lack background in statistics and computing
- 'cultural deficiencies' in distrust of machines and computer data
- some qualitative aspects of library operation not susceptible to quantitative assessment
- confusion arising from non-standard terminology
- most texts and manuals only available in the English language
- in that many results confirm a situation already known to the librarian, rather than springing surprises, the effort involved may appear disproportionate
- cumbersome presentation and lack of flexibility in pursuing lines of enquiry suggested by an initial analysis

Two levels of development are called for. The first - and the longest - is to raise the overall standard of performance measurement to that already practised by pre-eminent library managers. In each country, and between countries, there are large and crucial gaps between the average and the exemplary.

The second level involves work at the leading edge to produce more effective and flexible systems by and for leading institutions. There is substantial scope here with the power of contemporary software.

(b) SHORTFALL FEATURES

If progress has been slow and patchy, this is due both to important deficiencies in the established methodology and also to the limitations of systems software and hardware in the 1980s.

Shortcomings include:

- Early performance measures concentrated on Resources and Output totals - on how well resources were used rather than how well users' demand was met. The need to correct this perspective is now acknowledged.
- Outputs typically not related to user features. For example: public library in-house use can be analysed by age and purpose of users; academic library journal use by users' status and department.
- Analysis at top level only
- Historical data not available for trends to be studied
- Cumbersome nature of complete print-outs; inflexible or inadequate query facilities as alternative

One has only to examine these lists to see that most of these weaknesses can potentially be overcome.

(c) COSTS AND PERFORMANCE

The Toolbox differs from a number of published guidelines in treating cost analysis as an essential part of performance measurement. While for many years this has been inherently difficult and often avoided, the librarians we consulted were all keen to see Costs included.

The main problem can be presented quite simply. The obvious indicator is the Cost per Loan calculated as *Total (Net) Expenditure* divided by *Total Issues*. This is extremely crude and should mostly be avoided - since it makes no allowance for the extent of non-lending use of the library. Increasingly this is significant where there are:

- large reference and information functions
- services provided off the premises and through networks
- well developed special services to particular groups of users
- community services, educational programmes and exhibitions

In broad terms there are two approaches - both in theory and as found in practice.

Solution 1 concentrates on the output measure by replacing 'loan' in the 'Cost per loan' formula with a composite measure totalling either all the principal uses provided or all types of document delivery.

A 'total activity' example from a Swedish public library comprises:

Loans + Information queries + Storytelling attendances + Magazine/Newspaper reading + Visits + Event attendances

Using this measure, ratios are developed for indicators such as *Activities per capita*, *Costs per activity*, *Activities per opening hour*, *Activities per staff hour*. Ratios are produced for all service points: the inclusion of *Visits* is optional.

In UK university libraries a prototype 'document delivery' measure is made up of:

Loans + In-library consultations + Inter-library loans + (Photocopies/10) + Electronic documents delivered

Other composite measures, some of forbidding complexity, have been proposed in Italy and in Finland.

Such broad-brush formulae present a crude but feasible approach. Emphasis on diverse activity can have publicity advantages, although the measures are not readily understandable by the public. Less work is involved than in Solution 2 - but the answers are also less satisfactory than separate calculations.

Solution 2 is the Functional Cost Analysis approach - where costs involved in every principal service are estimated to produce a separate *Cost per loan* calculation for each main service provided and in each main location. A matrix outline is given in Figure 1.

A major feature is the analysis of staff costs according to staff time spent on main functions, such as:

- Lending & circulation (adult/children's combined or separate)
- Mobiles
- Information & reference
- Domiciliary service
- Specialist services, eg. archives, local studies
- Promotion
- Study spaces
- User training & instruction
- Acquisitions (Incl. Cataloguing)
- Regular children's activities
- Special events
- Preservation

It should not be necessary to install sophisticated or extra time clocking procedures. Annually each member of staff apportions the percentage of time spent on principal functions - this to be checked and agreed by management. (Percentages have the huge advantage that they must, by definition, come to '100%!') These percentages are then applied to annual staff cost figures and adjusted by an allowance for indirect and overhead charges. Management functions such as personnel and finance, are allocated to service functions in proportion to staff time or staff expenditure. In this way is derived a staff and management cost estimate for each main function on each site/service point.

This point is discussed succinctly in *Keys to success*, p.87 (King, 1990). That publication has a valuable summary of cost calculations (pp.87-92):

'There are three ways to measure staff time:

- use time sheets continuously or periodically throughout the year.
- observe staff on a random basis to determine the proportion of time spent on specific activities, services or functions.
- ask staff or their supervisors to estimate the proportion of time spent on specific activities, services or functions throughout a year.

Interestingly, the three ways of allocating staff time to services do not yield greatly different results.'

It is more straightforward to allocate other costs. Materials are conventionally charged to adult lending, adult reference, children's audio/visual, etc. and/or analysed as books, periodicals, CD-ROMs, music, maps, audio/visual, etc. Premises costs are allocated according to space used for different functions. Automation and other costs are allocated as appropriate - typically in proportion either to space of staff time employed on each function.

The results of this approach are Cost:Output ratios which are more exact and meaningful than any large composite measure can be. These superior measures apply to both the cost and output measures and indicators. In a large library they are vital for informed allocation of resources and to inform decisions on service expansion. Obviously a special or college library employing two to five staff does not need such management data to the same level as a university library system employing 200-500. But in more complex organisations - particularly where convergence brings new or blurred dividing lines - such disaggregation of cost measures are specially important.

Figure 1

<u>Cost benefit data</u>			
<u>Location</u>	<u>COSTS by Type</u>	<u>COSTS by Function</u>	<u>OUTPUTS</u>
<u>A</u>	Staff: professional, managers, etc. other	Lending/circulation	Loans: Books A/V Children's
	Materials acquired I.L.Ls	Information/reference	In-house use
	Automation	Acquisitions (incl. cataloguing)	Information queries
	Networking/Online	Preservation/conservation	Database accesses
	Admin. & Misc.	Specialist services - may include: local studies, archives, mobiles, domiciliary, house bound, schools services, business information, tourist inf., health inf., council inf. etc.	Newspapers
	Photocopying		Photocopying
	Premises	User training/instruction	Event attendances
	Instit'n recharge	Promotion/special events	Storytelling att'ces
	Cost of capital	Regular children's activities	Individual study hrs
	Cost of capital	Study spaces	
	GROSS EXPENDITURE (INCOME)		
	NET EXPENDITURE		
	TOTAL COSTS		TOTAL IDENTIFIED
			Total visits TOTAL VISITS plus OUTPUTS
<u>Location B</u> (Repeat)			
<u>Location C</u> (Repeat)			
↓			
<u>All locations</u> (Totals)			

Why has this not happened already? In the past inhibiting factors include:

1. no help with detailed procedures and inadequate definitions
2. no obvious application to the most pressing problems
3. no requirement formulated for systems work

4. lack of appropriate computer hardware and software

5. fear of accountancy precision requirement

The fourth factor should be overcome by modern relational database software on platforms now within a general price range. The fifth factor has been covered above: it is essential not to confuse this sys-

tem with that required to monitor and control expenditure. The first three factors are - in effect - the subject of this study: there are many decision areas where managers are currently navigating in the financial shadows.

The diagram in Figure 1 shows what issues are involved, and the complexities that will arise in local implementation.

Large organisations need to estimate costs in four dimensions:

1. by type of expenditure: staff, materials, premises, automation (income), etc.
2. by location: site, service point, information unit
3. by function: adult lending, children's lending, information, storytelling, events, reading places, etc.
4. by subject category and, for some purposes, academic department

The requirement is not to provide extensive weekly or monthly reports covering all levels of measure and indicator. The requirement is to provide facilities for cost:output calculations, or cost allocation ratios, on an enquiry basis as and when these are required to support particular investigations for decision steps. For this purpose data need to be readily accessible and conveniently manipulated for special reports and for ad hoc enquiries.

(d) HARNESSING COMPUTER POWER TO OVERCOME SHORTCOMINGS

In principle what is required is the ability to access datasets, in convenient enquiry mode, on a much larger scale than has hitherto been envisaged. It should now be within the capacity of the present generation of computer hardware and software to provide what is required. The models - and indicators to the level of analysis proposed - can not be said to be 'tried and tested' in practice. Most elements have been in operation in some places. Some items in the Toolbox therefore require feasibility study and development.

This proposal derives from the expressed needs of library managers - and from the logic of the situation. It is not a case of putting new technology to use because it is there, but rather that technology will now permit what has been a requirement for decades. It is in line with the reasoning in the draft IFLA Report *Measuring quality* (pp.11-14). It also represents a culmination of current developments in France (Tableau de bord), Sweden (Kristianstad), Denmark (Copenhagen Business School), Germany (Betriebsvergleich project), and Italy (composite

indicator). In all these instances librarians have been deriving valuable cost:output ratios, but have been unable as yet to come to an overall generalised solution.

The library manager needs to be empowered, not inhibited or impoverished. This is the strategic approach that underlies the innovative aspects of the Toolbox. Working this out represents a major change in approach. Generally systems analysts aim to hold and present only data which is specifically known to be in demand. The proposal here is for data to be held whenever it might be required - often in several years' time.

In this concept data are entered and held with regard to their ultimate not their immediate use. For example to hold date of birth, date of registration and post code area will allow not only correct calculation of fines and privileges but also analyses of lapsed users and comparisons of users:age/sex profile with residents in areas served. Studies can be made of library use by students by year and by faculty/department - compared with previous years' experience.

(e) THE MULTI-DIMENSIONAL DATABASE FOR ENQUIRY INTERROGATION

The data required comes from automated library systems, external database sources, and from manual sources. The purpose of this database (or linked databases) is to allow easier and more effective use of established performance indicators as well as more sophisticated features that include:

- functionally analysed expenditure/costs
- several years data held and analysed
- separate units within the library
- separate analyses according to subject disciplines
- 'real' data corrected for inflation indexes
- quantitative measurement of electronic services

The amount of data to be held - by modern industry standards - is not large. However the organisation of such data is a major undertaking relying entirely on Relational database and SQL software.

Procedures to maintain a readily accessible historical data file, and to relate this to the next year or two, need to be worked out and maintained with care and adequate documentation. A main objective must be to make the data collection process as easy as possible for the librarian, that is, requiring minimum effort and resources.

(f) LOWER LEVEL ANALYSIS

The need for this is paramount. Examples of what is required include the following:

- Library users:
 - breakdown by type of user or other attributes
 - user education hours
- Staff:
 - breakdown by job, function or task
- Library facilities:
 - equipment breakdown by type
 - shelving calculation according to open and closed access
- Library collection:
 - materials spend - breakdown by type of material or subject categories
 - spending on conservation
 - periodicals - paid/new/cancelled subscriptions
- Library use:
 - remote use - defined according to telephone, fax, electronic mail etc.
 - in-library use - breakdown by material type eg. periodicals, reference
 - materials; by facility eg. CD-ROM, photocopiers
 - number of issues - breakdown by loan, renewal and reservation, time of day
 - attendance at in-house activities eg. storytelling sessions

(g) DATA FOR OTHER YEARS

To establish trends data need to be held for recent years. Practitioners feel this is important. However in existing computer systems there have been severe feasibility problems in holding and accessing historical data - in terms of the hardware and software employed in stand-alone systems. Neither has such a demand been clearly enunciated.

For some features aggregated data should also be available for the preceding ten years. As can be seen from Figure 1, the amount of data conceptually required for such a database is very large - and it is not feasible for traditional 'MIS type' reports or spreadsheets.

This need is recognised and extended in the 'tableau de bord'.

'The "tableau de bord" does not have the same role as the statistical enquiry. It is not limited to establishing what has happened: it is an instrument for forecasting and navigating - essential to the local plan . . . The "tableau de bord" by way of elaborating these decisions has also a retrospective effect thanks to a regular monitoring of results. Decision makers can then correct or adjust (in good time) the actual events, and effectively reformulate the paths chosen, the objectives and action plans.'

So is added the immediate future and the planning/budgeting dimension.

How long is 'the recent past'? Practitioners consulted in the course of our study focused on the last ten years rather than the last five. On this database the 'future' should at least cover the budget for the present year and a forecast for the year following. Beyond that lies strategic or medium/long-term planning, which will have important connections between this database with its performance indicators and such longer-term plans.

For how many indicators and measures should historic data be held? This is not easy to decide, but the following guidelines should be helpful:

- there is no need to hold more than annual results: data for intermediate periods will not be required
- detailed analysis needs to be held either in percentage form or in absolute numbers, not both
- at least the first level of breakdown will be required for expenditure, materials, subject categories, user categories etc.
- whether to hold data for each site or for the whole library system will depend on the size and structure of the library authority. For all but the smallest units, it will normally be valuable to hold data separately for the central library and for the whole system. Much data should also be held for each service point.
- since organisational arrangements and provision of buildings and technological features change unpredictably over time, the holding of disaggregated data is to be encouraged.

Sights need to be set beyond the circumstances of the present scene to the uncertain future. As already propounded above, here it is not appropriate to follow the limiting maxim that 'data should only be collected and held where there is a demonstrable need'.

III. Particular Proposals

(For all items in this section measures can be used as such or converted to give 'per capita' ratios of performance.)

III (a) ANALYSIS OF STAFF TIME

As discussed above, this is to provide data (1) for monitoring, review and decisions on optimum allocation of staff time; (2) to publicise to outsiders the variety of tasks undertaken; and (3) to calculate cost:benefit (cost:output) ratios.

The categories for analysis will vary according to local circumstances. The lists that follow indicate likely minimum or core requirements and a longer list of further options:

<u>Core Categories</u>	<u>Further Options</u>
Lending & Circulation	Children's/Adult work
Reference/Information	Mobile Service
Acquisitions/Cataloguing	Specialist services, eg.
Training Users	Archives
Automation	Local Studies
Management	Business
Promotion/Special Events	Domiciliary Service
Miscellaneous	Conservation /
	Preservation

III (b) SPEED OF SUPPLY/REACTION BY RETROSPECTIVE SAMPLING

Measuring this is properly done by sampling. However it is not everywhere realised that there are advantages in taking the sample at the end of the process rather than identifying sample items at the start. Clerically much less work is involved; it is also less susceptible to manipulation in that staff do not have the opportunity to give preferential treatment to items earmarked as part of a sample. In presenting average results the 'median' is preferred to the 'arithmetic mean'. This technique only takes account of items that have been supplied, so the number or proportion of failed actions has to be a separate measure.

We give here examples to illustrate the technique rather than a comprehensive set of applications.

To determine the time taken to acquire items and to make them available to users the following steps are undertaken:

1. Take a sample of items that are newly available on the shelves.
2. Obtain data on the date each item was ordered by the library.
3. Subtract the order date (or publication date where books were ordered prior to publication) from the current date.

4. Calculate the median number of days taken for all items in the sample - or the proportion of items made available within n days.

For more detailed analysis each individual stage through ordering, checking, cataloguing and processing can be analysed separately, if data is collected at each point. This is an important measure to identify bottlenecks and delays at different stages in the supply process.

This sampling technique should also be applied to the overall speed in satisfying requests - the time taken to satisfy all types of request for material not immediately available on site. This covers time taken for delivery of material to be supplied through acquisition, interlibrary loan, fetching from other sites/service points, and material recalled where it is already on loan. Each of these is also an indicator in its own right. (Note the Essex 'success stories', illustrated in Figure 2, where one graph shows both increased use, shorter throughput times, and the trends over recent years.)

From a selection of satisfied requests the time is taken from the original request date to the date the user is notified of availability. The indicator is the average (the median, not the arithmetic mean) of these results.

III (c) (1) USER ANALYSIS BY TYPE OF USER

Categorisation of users will often be demanded for these measures. In academic libraries this will typically be by faculty/department and by status, in public libraries by age, sex, status and residence - such as:

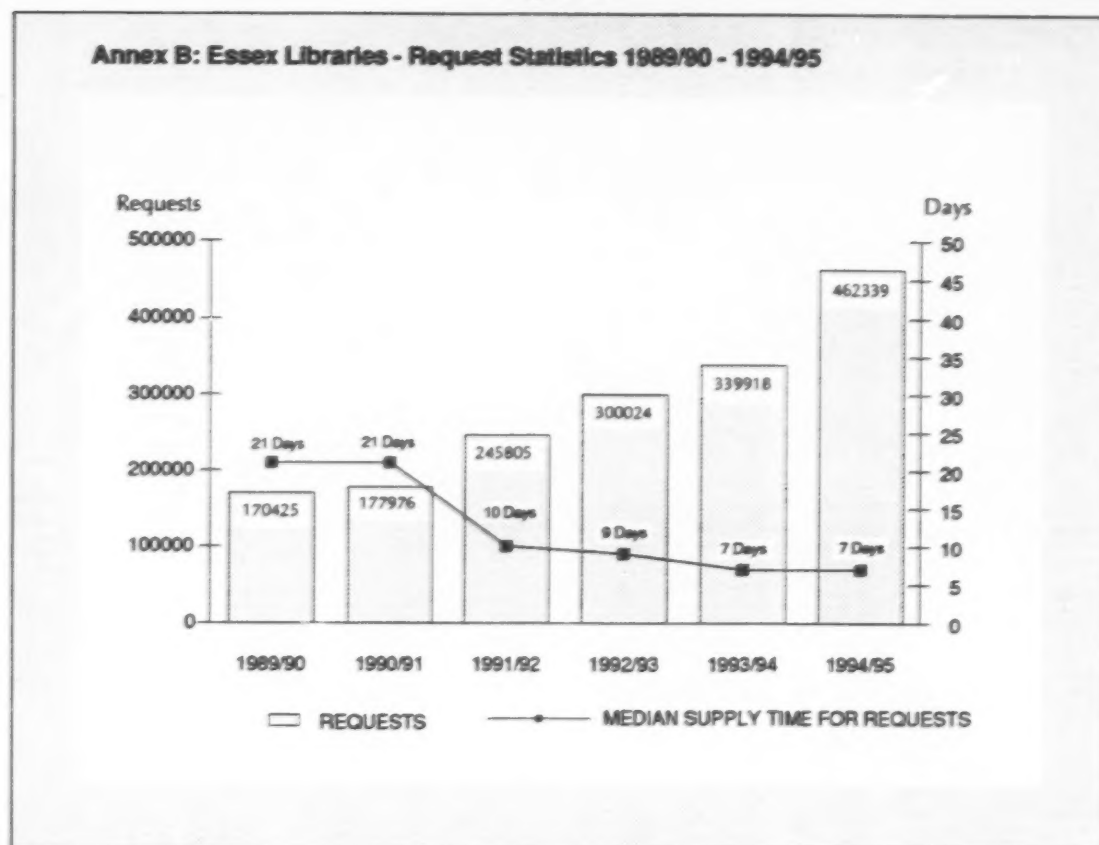
- | | |
|--------------------------|-----------------|
| - undergraduate students | - children |
| - postgraduate students | - young adults |
| - academic staff | - adults |
| - external visitors | - pensioners |
| - others | - non-residents |
| | - unemployed |
| | - disabled |

III (c) (2) ACTIVE USERS

To determine the number of active borrowers (those who have had at least one item issued to them in the last 12 months) is possible with most automated circulation systems. If the system, or a significant part of it, is not automated, this can be difficult or impossible. But to limit the count to borrowers is not ideal, so there are ways to extend this to all active users.

To establish the proportion of the population using the library we need to know the number of people from the target population who have used the library during the last year. This can be obtained

Figure 2



by one of two methods: either (1) In a survey of the *target population*, people are asked whether or not they have used the library during the last year; or (2) Establish from a questionnaire survey the proportion of users who never borrow material and apply this percentage to the *number of active borrowers*.

Example: A users' survey establishes that 14% of users have not borrowed material in the previous 12 months. The number of borrowers who have taken out at least one book or A/V item in the previous 12 months from that service point is 12,260. The number of *active library users* is therefore:

$$\frac{12,260}{(1 - 0.14 = 0.86)} = 14,256$$

III (d) USE OF INFORMATION SERVICES

Counting the number of Reference Transactions handled is not without its problems. It is difficult to achieve consistency when transactions are counted by library staff either on a sample or an ongoing basis. However, a major drawback is that success in getting users to help themselves to information - by

well signposted stock, for instance, has a negative effect of the Transaction count.

To overcome this weakness a modification to the ALA Needs Fill Rate questions is proposed by including a question:

If you were looking for information (ie. to find something out) were you successful?
 YES / NO / PARTIALLY
 Did you consult a member of staff? YES / NO

The results assess (1) the success of users in obtaining information on their own, (2) their success in queries addressed to staff, and (3) the proportion of users requiring information. The data relate to specific needs on a particular day, and they rely on the users' immediate assessment of satisfaction.

III (e) SPACE PROVIDED

This can be categorised according to purpose:

- (i) 'Library Services' includes space used for reading, studying, information delivery, computers and any other services delivered to users by library staff.

- (ii) Library operations includes receipt of materials, bindery, acquisitions, cataloguing, computing, and management.
 - (iii) Materials storage includes all areas principally devoted to materials whether open access, closed access, special collections or reserve stock.
 - (iv) Special events includes seminar and meeting rooms, space for groups to meet, and exhibition space.
 - (v) Miscellaneous includes cafés, toilets and staff recreation areas.
 - (vi) Access measures space required only for access to other areas, ie. corridors and gangways.
- (v) and (vi) need not be separated; in small libraries categories (i), (ii) and (iii) will be sufficient.

Measurement of space is useful to review allocation of the space provision and to establish or avoid the need for new building. A further analysis by principal services delivered will also be valuable in many situations, eg. space taken up by special collections, local history, special information services, etc. Factors for the allocation of premises costs to particular services and/or functions can be established.

Measurement of floor areas can often be taken from data used for other purposes, eg. cleaning contracts, insurance quotations. Space measurements should be checked for an annual review, but there is no need for frequent recalculation. Precision in the allocation of space between categories is not essential.

This measure should not include space occupied by theatres, museums, concert halls where these are not used for 'library' purposes but may be physically on the same premises. Space for reserve stock is included in (iii).

III (f) STOCK QUALITY ANALYSED BY AGE AND BY TITLE COUNTS

The Age of items in stock is a simple calculation showing the proportion of stock more than n_1 , n_2 , n_3 , n_4 . . . n_k years old. Items are counted relative to year of acquisition or year of publication. Generally the date of acquisition is preferred - since an old book acquired during stock revision will clearly be still popular at the date of acquisition.

Example:

Bookstock	0-5 years old	61%
"	6-10 years old	12%
"	11-15 years old	4%
"	16-20 years old	3%
"	21 + years old	20%

There is more scope for Title counts in sets of performance indicators than is indicated in recent literature. To assess the staleness/appropriateness of stock a count of titles that have issued during the year (or quarter) can be compared with the number that have stayed on the shelves. This can be particularly revealing for separate sections of stock, although it does not, of course, cover use on the premises.

Titles added per capita, Copies added per title added, and Titles issued per capita are all indicators revealing the extent to which multiple copies of best-sellers conflict with objectives of stock variety and depth of interest. These are of particular interest to large public library authorities needing to balance decisions in the 'popular materials' interest of particular service points as against the breadth required in the overall collection of the authority.

III (g) INTER LIBRARY LOANS v. ACQUISITION

Cost and performance data for demand satisfied through Interlibrary Loans are required to compare with costs of acquisition and holding. Measurable costs include payments for staff time, storage space, overheads, notifications and subscriptions as well as direct payments for material bought in. Measurable performance covers speed of supply. Some important unmeasurable factors are also relevant.

III (h) SERVICE POINTS AND OPENING HOURS

Service points that open for only a few hours each week, and small informal collections of material, can be excluded from the count where there is a minimum qualification, for example: 'Service points open 10 hours/week and more'. Another method to assess differences is to tabulate the count:

Example:

Service Points open 45 hour/week and more	2	
Service Points open 30-44 hours/week	4	
Service Points open 20-29 hours/week	7	
Service Points open 10-19 hours/week	1	
Mobiles	2	16
Service Points open less than 10 hours/week	5	
Homes, hospitals, etc. served	18	39

As a base for performance measures these totals are of limited value.

Multiplying Service Points by Hours Open (to give Service point hours open) is some improvement, but it only gives an accurate reflection of the level of service where (i) there is a single service point in the authority/institution, (ii) where all service points open for the same number of hours each

Figure 3

	1993			1994		
	Bookstock '000s	Opening Hours	Mult'n	Bookstock '000s	Opening Hours	Mult'n
Central Library	50 x	60 =	3000	50 x	48 =	2400
Large Branch	30 x	50 =	1500	32 x	48 =	1536
Medium Branch	20 x	44 =	880	18 x	42 =	756
Small Branch	6 x	24 =	144	5 x	24 =	120
New Small Branch	-	-		4 x	24 =	96
	106		5524	109		4908
Weighted Average Opening Hours	5524			4908		
	106	= 52.1		109	= 45.0	

week, or (iii) where the subsidiary service points are not significant and can be ignored. Total service point hours can give a very misleading picture where there are multiple service points open for a different number of hours per week.

To overcome these problems a new measure is proposed:

Weighted average hours open per week

Definition: Average hours per week library services are available. A weighting factor relating to the size or use of service points is used in calculating the average.

Method: Opening hours for each service point are weighted according to the size/use of that service point to produce an average figure. Weighting factor can be either Issues, Floor Space, Staff numbers, Stock, items On Loan, Readers' Seats or Visits - whichever is most appropriate or critical. For public libraries Issues or items On Loan will be favoured. For academic libraries it may well be Readers' Seats (student bias) or Stock (research bias).

Example: For the purpose of illustration we choose Bookstock for the weighted average calculation, which then gives these results for 1993 and 1994 (Figure 3).

This measure refers to hours services are physically available to users on library premises. Distinction can be made between (a) full services, and (b) partial services. In academic libraries separate counts are needed for term time and vacations.

IV. Differences between Types of Library

During our consultations surprise was frequently expressed that we were covering, in one study, both academic and public libraries. The tradition in

the literature of performance indicators is for separate treatment. We believe it was good to have the combined approach - partly because computer systems generally have to cater for all types.

However this does mean that the Toolbox must be viewed sensitively. Many of the indicators and proposals will apply to some types of library only.

Some of the most significant variations are these:

- large university library with central and departmental libraries on several sites
- university library on one central site
- special libraries employing 2-5 staff with heavy online information load
- large public library authority employing hundreds of staff in 30-80 service points grouped in areas
- substantial public library authority with large central library and several branch service points
- city public library
- small town public library

The principles underlying the Toolbox can apply to all these situations, but the appropriateness of particular indicators will vary greatly.

School libraries were not considered as part of this project; special libraries and college libraries have received less consideration than university and public libraries. National libraries or regional co-operatives were not covered.

Even more important is the question of size. There are substantial variations between large and small library authorities. The Toolbox is constructed to cater for the largest. Clearly there are many items that will not be appropriate for smaller organisations, and this needs to be borne in mind throughout.

Conclusions

In practice local and national definitions will be required. It was not an objective of this study to standardise detail - but rather to outline information requirements for future computer systems development. This work is being undertaken in the four successor projects of the European Commission - DECIDE, DECIMAL, EQLIPSE, and MINSTREL - for which this Toolbox study is a base.

There is also the obvious need to extend performance measures to the software and networks that handle electronic journals and new media. This all represents an ambitious work programme!

Example page from the Toolbox Study to be published October 1995 by Office of the European Communities in series 'Libraries in the information society' ref. EUR 16448 EN.

Title: *Library Performance Indicators & Library Management Models*. Authors: Sumson, J. and Ward, S.

J.22 Number of items of equipment in the library per capita

Method: The number of items of equipment (e.g. CD-ROM access points, OPAC terminals, PCs, photocopiers) available to users in the library, divided by the target population [This can be expressed per 1,000 or per 100 or inverted]. Each category should be calculated separately.

Interpretation: Indicates the level of provision. Use and user satisfaction should also be considered.

J.23 Seat Occupancy

Definition: The ratio of occupied seats to the total number of readers' seats.

Aim: To indicate the extent to which seating is occupied as an indication of availability of seats for users.

Scope: The indicator is suitable for types of library offering facilities for study and reading. It can be applied to separate areas of the library.

Method: At predetermined time intervals count the number of seats occupied and divide by the total seats available. This can be done in two ways:

(a) **Peak:** To determine an occupancy rate when pressure is greatest, for example in an academic library at 1100, 1200, 1400 and 1500 hours during the busiest weeks of term.

(b) **Average:** Sample at hourly intervals during typical weeks three or four times a year (in academic libraries: mid-term weeks).

Interpretation: A high occupancy rate may point to inadequate seating for users.

Factors affecting the Indicator: Weather, time of year, timing of examinations and vacations.

J.24 Facilities use rate

Definition: The proportion of time a library facility (e.g. a seminar room) or an item of equipment is busy.

Method: Equipment and facilities are observed at sample times to determine whether or not they are being used. Every person using, or waiting to use the equipment or facility is counted, and the total is divided by the number of that type of equipment or facility. (See *Measuring Academic Library Performance* pp82-88 for detailed description.)

*** J.31 Users' satisfaction with library facilities**

Definition: Users' rating of their satisfaction with library facilities, e.g. readers' seats, CD-ROM, OPAC, computers, photocopiers. (Ratings for each should be collected and analysed separately.)

Method: In a questionnaire-based survey, users of the reference service are asked to rate their satisfaction with the particular facility. Questionnaires frequently use a five-point scale, ranging from 1 for "not satisfied" to 5 for "very satisfied".

More detailed analysis:

1. Users could also be asked to rate the importance (to them) of the particular facility.

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